REMARKS

In the Official Action mailed on **15 May 2007**, the Examiner reviewed claims 1-35. Claims 1-35 were rejected under 35 U.S.C. § 103(a) based on Zhang et al (USPub 2003/0061587, hereinafter "Zhang"), and Shi et al. (USPN 6,519,760 hereinafter "Shi"), and Pierrat et al. (USPN 6,453,457 hereinafter "Pierrat").

Amendments to the specification

Applicant has amended the specification to correct typographical errors.

Rejections under 35 U.S.C. § 103(a)

Independent claims 1, 12, 23, and 34-35 were rejected as being unpatentable over Zhang, in view of Shi, and further in view of Pierrat. Examiner acknowledges that Zhang does not disclose generating intensity gradients which include both magnitude and angle. Nevertheless, Examiner avers that Shi substantially teaches the steps of performing a model based simulation on the layout to generate intensity gradients.

Applicant respectfully points out that Shi discloses a method for performing illumination design and utilizing scattering bar placement to optimize overall printing performance (see col. 4, ll. 1-12 of Shi). Note that the angled components in Figs. 3 and 12 of Shi indicate the **illumination angle**, which is the angle between the illumination direction with the normal direction of the mask surface (see col. 6-7, ll. 66-15, col. 11, ll. 56-63, and Figs. 3 and 12 of Shi). In addition, the angled components in Figs. 1 and 5 are simply **angular coordinates** (see col. 6, ll.18-25, Figs. 1 and 5 of Shi).

In contrast, the present invention teaches generating a segmentation for edges in the layout based on the **2-D gradient** which includes both magnitude and **angle** to determine dissection points (see [0007] of the instant application). The angle of the gradient and the illumination angle are two different concepts. The intensity gradient is a **vector** that indicates the **changes of intensity**, and thus comprises both magnitude and direction, in which the magnitude is expressed as a numbered quantity and the direction is expressed as an angle. However, the illumination angle mentioned in Shi is just the angle that indicates the direction of the illumination light rays, and **does not** indicated changes in the light intensity. Although Shi discloses calculating the **log-slope** of light intensity which indicates the change of light intensity, Shi uses the log-slope as a **scalar** which contains no angular component (see Fig. 12 of Shi).

Further more, nothing within Zhang or Shi teaches generating a segmentation for edges based on intensity gradient. Zhang simply dissects the polygon edges into OPC segments according to the **received OPC parameters** and does not mention anything about intensity gradients (see [0049]-[0050] and Fig. 5 of Zhang). Also note that Zhang did not disclose how to obtain those OPC parameters that contains the information about segmentation of the edges. Shi does not mention edge segmentation at all.

Accordingly, Applicant believes that Zhang and Shi, either standing alone, or combined, do not teach or suggest **generating a segmentation** for edges **based upon the intensity gradients** including both magnitude and angle.

Hence, Applicant respectfully submits that independent claims 1, 12, 23, and 34-35 as previously amended are in condition for allowance. Applicant also submits that claims 2-11, which depend upon claim 1, claims 13-22, which depend upon claim 12, and claims 24-33, which depend upon claim 23, are for the same reasons in condition for allowance and for reasons of the unique combinations recited in such claims.

CONCLUSION

It is submitted that the present application is presently in form for allowance. Such action is respectfully requested.

Respectfully submitted,

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